EXHIBIT B

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA, SAN FRANCISCO DIVISION

IN RE SEAGATE TECHNOLOGY LLC LITIGATION CONSOLIDATED ACTION	Case No. 3:16-cv-00523-JCS **DECLARATION OF DONALD ADAMS, PE IN SUPPORT OF SEAGATE'S OPPOSITION TO PLAINTIFFS' MOTION FOR CLASS CERTIFICATION** **Date:** March 30, 2018 **Time:** 9:30 a.m. **Place:** Courtroom G **Judge:** Hon. Joseph C. Spero Second Consolidated Amended Complaint filed: July 11, 2016

UNREDACTED VERSION OF DOCUMENT SOUGHT TO BE SEALED

40 year-olds. Similarly, the AFR for drives manufactured in 2011 vs. those manufactured in 2012, does not tell you whether drives used for 6 months have a higher or lower chance of failing *compared to drives used for 2 years*. That Hospodor thinks that his sequence of three AFRs (from three different test populations of drives all tested to the same age) can be used to determine whether Beta was greater than 1 further demonstrates Hospodor's fundamental misunderstanding of accepted reliability analysis methodologies (in particular, the Weibull distribution and the significance of the Beta parameter). It is simply not possible to use the sequence of AFRs Hospodor cites to reach his stated conclusion that Beta was greater than 1 or that the drives were 'wearing out prematurely.'

74. Hospodor goes on to say in Paragraph 91 that Beta or the shape parameter is the more important of the two primary parameters in the Weibull distribution. This is not correct, as explained in Paragraph 37 above.

2. Hospodor's Reliance on Khurshudov Is Misplaced

75. Beginning in paragraph 96 through 111, Hospodor introduces and discusses former Seagate employee Andrei Khurshudov's ("Khurshudov's") report on "Product Failure Rate Trends and the Role of Workload Stress" from about June of 2012 at which time he worked for Seagate. First, Hospodor simply ignores the fact that the Khurshudov report's conclusions do not apply to consumer, desktop drives like Grenada. In fact, in his deposition, Khurshudov explained that for desktop drives used in consumer applications (like Grenada), ***his report showed that those drives always behaved as expected, with Beta less than 1***. (Ex. 14 [Khurshudov Depo.] 126:23-129:10 ("The thing is for the -- this client space, ***for desktops and mobile drives***, this ***-- this study actually didn't show any even hints of wearout. The beta is always below 1***. So the conclusion would be -- and this is again part of this study -- ***it's a low workload environment, and drives behave exactly how we expect***. It's our mission critical products that might be affected.") Hospodor simply ignores what Khurshudov said about the conclusions of his own report, and then misapplies the report—to reach the opposite conclusion from what the report actually showed (which was Beta was less than 1 on consumer, desktop drives).

76. Second, there are several flaws in the report that Hospodor incorrectly endorses. These are:

a. Hospodor endorses the statement shown in the slide in his Figure 11 that wear out phenomenon (where Beta >1) is highly undesirable. This idea is naive. "Wear out" is unavoidable; everything eventually wears out (or dies). The key to a successful product is that its characteristic life is long enough to meet service life expectations.

b. The data is based on returns, not failures. Returns include failures and non-failures, and non-failures can be a large fraction of the total. For example, another document by Khurshudov shows that over 75% of returned products can have no trouble found, and a large proportion may never have even been used. (Ex. 15 [FED_SEAG0002320] at 2327; Almgren Decl., ¶ 25; Ex. 14 [Khurshudov Depo.] at 36:25-39:14.) Furthermore some failures may not be returned. Drawing conclusions about failure rates from return rates is unreliable.

c. In Paragraph 100 Hospodor refers to the plot taken from Khurshudov's report shown in Figure 12 of his declaration. (See Hospodor Decl., ¶¶ 101 and Figure 12.) Both Hospodor and Khurshudov incorrectly conclude that the curves are "exhibiting failures rates consistent with β increasing to and possibly surpassing a value of 1." First, Khurshudov testified that he drew his conclusions by simply 'eyeballing' the graph in question, and drawing some lines, but did not do any mathematical analysis of the data. (Ex. 14 [Khurshudov Depo.] at 88:17-90:1, 95:7-96:18, 96:23-97:23, 99:1-9.) Hospodor acknowledged in his deposition, that visual examination of graphs like Figure 12 cannot be used to make conclusions about Beta. (Ex. 11 [Hospodor Depo.], 88:10-96:10.) However, this is exactly what Khurshudov did, and Hospodor adopts Khurshudov's unfounded, 'eyeball' opinions even though he acknowledges that Khurshudov's approach is unsound.[21] (*Ibid*.) Moreover, all of the curves in this plot are consistent with Beta < 1. In fact, ***the graph at issue shows that Beta and/or the characteristic life (scale parameter Eta) are decreasing for the cumulative return data plotted***. For example, Figure 4 below shows a constant Beta and a ***decreasing Eta***.

[21] Even Khurshudov noted on the slide at issue that more complete data analysis is needed to confirm his observation, yet Hospodor accepted the observation (which is methodologically unsound) without any further data analysis.

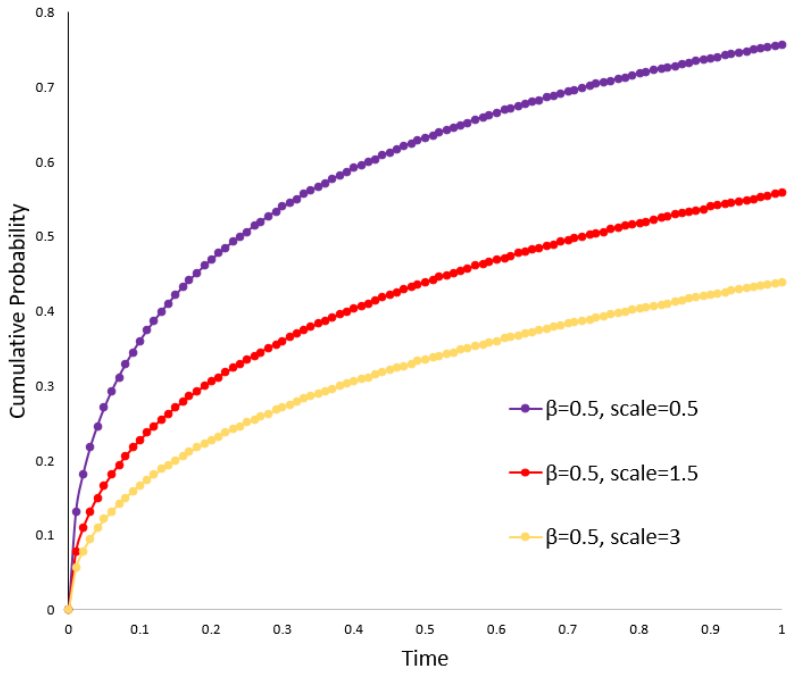


Figure 4. Shape parameter (β) held constant at 0.5; scale parameter (η) decreasing from 3 (gold line) to 1.5 (red line) and 0.5 (purple line). (Figure prepared using Excel and Excel's Weibull function.) **(FIGURE 4 SOUGHT TO BE REDACTED)**

d. After adopting Khurshudov's incorrect 'eyeball' claim that Beta showed a "progression" from β<1 to β>1, Hospodor goes on to claim that "the data points of ***the Grenada fall[]in the β>1 range.***" (See Hospodor Decl., ¶¶ 101.) Hospodor makes a conclusion about "the Grenada" drives even though Khurshudov refused to draw any such conclusion because there simply was not enough data about Grenada. (*See* Hospodor Figure 12 ("We should wait until we could make a conclusion about Grenada"); Ex. 14 [Khurshudov Depo.] at 99:25-101:10.) Moreover, as noted, Khurshudov explained that his report showed for consumer drives Beta was always less than 1 and the and the conclusions about Beta greater than 1 and wear out did not apply to desktop drives like Grenada. (Ex. 14 [Khurshudov Depo.] 126:23-129:10.) Hospodor's attempt to stretch Khurshudov's statements to cover Grenada drives lacks any reasonable basis and is not supported by the data.

e. Both Hospodor and Khurshudov repeatedly say that Weibull Beta or shape

values are 'assumed.' As previously discussed, this is simply not the case. (See Section IV.B.) It appears that Khurshudov was not involved in Seagate's actual reliability testing or calculations of AFRs, so this may explain why he made misstatements about how Seagate actually determined Beta and AFR.[22] (See Ex. 14 [Khurshudov Depo.] at 13:24-15:11; 24:16-25:16.; Almgren Decl., ¶ 24.) At any rate, Khurshudov explained in his deposition that Beta and AFR are based on fitting the Weibull distribution to actual test data (Ex. 14 [Khurshudov Depo.] 47:13-49:5.)

f. The emphasis both Hospodor and Khurshudov place on the Weibull shape parameter, Beta, while excluding the characteristic life, Eta, is not correct. At least two parameters are need to make a useful AFR projection, and the Eta parameter is just as important as Beta.

77. In Paragraphs 106 to 108 of his declaration, Hospodor references a suggestion by Khurshudov that "Longer-term reliability tests (~1 Year) might need to be introduced to gain more confidence in reliability projections." ***But Khurshudov testified that this conclusion did not apply to desktop or consumer drives like Grenada***—it only applied to high-workload, enterprise drives (Ex. 14 [Khurshudov Depo.] 126:23-129:10.) Furthermore, it is true that confidence in the projections can be improved this way and more knowledge of eventual wear out behavior and mechanisms can be gained. It is also true that increasing the number of test samples will improve confidence in the projections. However, there is no reason to think this was necessary to adequately test the Grenada drives and Hospodor provides no basis for so thinking. Certainly Khurshudov made no such conclusion. (*Id.; see also* Almgren Decl., ¶ 26.) Hospodor offers no basis for extending Khurshudov's suggestion to consumer, desktop drives like Grenada, and I see none. First, for HDDs designed for enterprise use (data center applications, servers, cloud computing, etc.) both the number of samples and test time is increased in my experience. By contrast, Seagate's RDT and

[22] The only role in which Khurshudov was involved with reliability was a research role from 2006 to May 2008, and that role did not involve analyzing reliability of any specific products. (*Ibid*.) At the time he wrote the report in question he was "senior director, cloud research and analytics" but Glen Almgren reports that—consistent with his title at the time—Khurshudov was not directly involved in RDT or product qualification and would not necessarily have known how Seagate determined Beta and AFR in those contexts. (Almgren Depo., ¶ 24.)

ORT reliability testing protocol for the Grenada drives—1000 HDDs for 1000 hours—has been widely accepted in the industry for drives like the Grenada drives that are intended for desktop computer applications.[23] Even Hospodor acknowledges that test protocols can be shorter than what Seagate used (30 days rather than 6 weeks). (Hospodor Decl., ¶ 34.) Furthermore, as explained, because Seagate tested the drives at maximum workload (and high temperature) for 6 weeks, Seagate subjected the drives to the equivalent of over 3 to 3.8 years of use and wear. This is more than sufficient to obtain data to project reliability characteristics of the drives over the expected useful life of the drives with reasonable accuracy. Other than his wholly incorrect application of the Weibull analysis (Paragraphs 41, 70-76), and his misplaced reliance on, and misapplication of, Khurshudov's incorrect conclusions (Paragraphs 75, 76), ***Hospodor provides no basis for asserting that Seagate's testing of the Grenada drives was insufficient***. Therefore, Hospodor's claims that Seagate's reliability testing was inadequate and that AFR projections were overly optimistic is not supported by his alleged evidence or arguments. Nonetheless Seagate also tested drives for extended periods of time (an additional 3-6 weeks after the normal 6-week test) to confirm that Beta remained below 1, which it did. (Almgren Decl., ¶ 28; Ex. 13 [Almgren Depo.], at 88:5-90:6.)

3. The Grenada BP2 Test Results

78. In paragraphs 112 to 117 Hospodor misinterprets the GrenadaBP2 reliability test results shown in Figure 14 of his Declaration. He incorrectly states "the AFR increased from 1.039% in the first year to 1.951% in the fifth year." The values for the second year (2Yr FR) through fifth year (5Yr FR) are ***cumulative failure probabilities (FR)*** projected by the Weibull CDF using estimated parameters based on the test data. They are consistent with an estimated shape factor, Beta, less than 1. Therefore his conclusions are mistaken.[24] Moreover, this document shows

[23] This test design is a good balance between cost of samples and equipment and schedule. For no failures during the test this demonstrates reliability of 0.998 with 90% confidence using the Binomial distribution. The annualized failure rate (AFR) for a product operated this much in one year would be less than 1%.

[24] That the 2Yr FR to 5Yr FR are cumulative and not "annual" would seem obvious given that the first year value is "AFR" (the "annualized" failure rate), but the subsequent numbers are not labeled "**A**FR" and instead are labeled "FR." In addition, the only way to arrive at any of these values is to use the Beta and Eta parameters to model the data and derive the AFR and FRs. The AFRs and FRs can't be "inconsistent" with the listed Beta, because the listed Beta was used to produce the AFR and FRs.

that when the Grenada BP2 drives were approved for general release as internal, desktop drives (Disty/OEM), the Demo' d first year AFR was 0.90%. Furthermore, the cumulative failure rate (probability) at the 5th year was less than 2%--meaning that even after 5 years of use, based on its RDT test data, Seagate projected that only 2% total of drives would have failed, while 98% would still be operational. This exceeds the goal in the table from the "5-year BIC Service Life Strategic Initiative." (See Figure 3 above.)

D. The Backblaze Blog Posts Do Not Support Hospodor's Conclusions

79. In Paragraph 104, Hospodor references Backblaze blog posts and implies that they support a conclusion that "the ST3000DM001 … were not as robust as the competition."[25] However, the blog posts do not support this conclusion. It is incorrect to conclude that Backblaze compared the Grenada 3TB drives to even a reasonable sample of competitor drives. For example, Backblaze did not use or "test" enough Samsung or Toshiba drives to even make a comparison, and Backblaze also excluded certain 3TB Western Digital drives from its analysis because they performed too ***poorly***. (See https://www.backblaze.com/blog/what-hard-drive-should-i-buy/ ("We don't have enough Toshiba or Samsung drives for good statistical results" and later reporting that Backblaze excluded Western Digital 3TB Green drives because they failed so quickly.)) In fact, Backblaze only used one other brand of 3TB drives in any significant numbers (HGST), while excluding 3 brands (Samsung, Toshiba and Western Digital). One cannot conclude that the Seagate Grenada 3TB drives were less "robust" than "the competition" when Backblaze only used 1 of 4 competitor brands but not the other three.

80. Moreover, Bakcblaze mishandled and misused the drives, and there are other problems with the blog posts. Seagate's witnesses have explained that log data for drives Backblaze claimed had failed showed a high percentage of the drives with No Trouble Found ("NTF") indicating that the drives were working properly and the failure rate was not what Backblaze reported. (Ex. 17 [Rollings Decl.], ¶ 7.) The boxes or "Pods" into which Backblaze inserted the Grenada 3TB drives (the Pod 2.0 design) was highly flawed, and subjected the drives to excessive

[25] Hospodor does not explain how the blog posts are relevant to his discussion of Beta—they are not.

vibration and potential mishandling. (*Id.*, ¶¶ 4, 5, 8, 9.) Backblaze **admitted** that it had subsequently redesigned the Pod 2.0 to reduce vibration, and that this significantly reduced drive failures even over a short period of time. (See https://www.backblaze.com/blog/180tb-of-good-vibrations-storage-pod-3-0/ (stating that changes were made in the transition from the Pod 2.0 design to the Pod 3.0 design to reduce vibration and that even within a few months, these changes resulted in a "***dramatic improvement*** in overall system performance along with lower drive failure rates.") This indicates that the long period of time (several years) that the Grenada 3TB drives were in the high-vibration Pod 2.0 design was likely a substantial factor in any failures Backblaze observed. Backblaze also admits it operated the drives in a commercial, high-workload 24/7 environment—which is very different and much more stressful to the drives than typical consumer desktop use. (See Rollings Decl., ¶ 5)

81. Finally, Backblaze reports that it purchased over 80% of its ST3000DM001 drives ***before*** September 2012, and purchased all of them by the end of 2012. (*See* https://www.backblaze.com/blog/3tb-hard-drive-failure/.) Seagate approved shipments of Grenada BP drives in April and June 2012, and projected Grenada BP production would equal Grenada Classic production around September 2012. (Ex. 4 [FED_SEAG0026751] at p. 26787; Dewey Decl., ¶ 18.) This means that almost all of Backblaze's drives were Grenada Classic drives manufactured in 2011 and 2012. Even if the Backblaze blog posts were credited (they should not be), the posts could not support conclusions about Grenada BP or BP2 drives, or drives manufactured after 2012.

VIII. Hospodor's Remaining Sections and Evidence Do Not Support Any Claims about the AFR of the Drives or Hospodor's Claim that the Drives Were Released Prematurely or Were 'Unstable' and 'Unreliable' (Hospodor's Section IV.I)

82. As explained in the preceding sections, the data and documents Hospodor cites do not support his conclusions that any version of the internal, desktop drives had a higher than 1% AFR, or that any Grenada drives had a "higher than advertised" AFR. In the remainder of his declaration, Hospodor claims that other evidence (related to yield, ECRs, firmware releases, ship holds, etc.) shows that the drives were "unreliable" and were "released prematurely." Importantly, none of the evidence Hospodor cites can support a conclusion that the AFR for any drives was

not evidence that problematic or "unreliable" drives were shipped to consumers. The evidence instead illustrates Seagate's organizational resolve to find and fix issues as they arise.

105. [redacted]

E. Hospodor Does Not Support His Claim that Seagate Documents "Acknowledge" that the Drives Were "Unstable, Unreliable, and Defective" " (Hospodor's Section IV.I.2(f).)

106. [redacted]

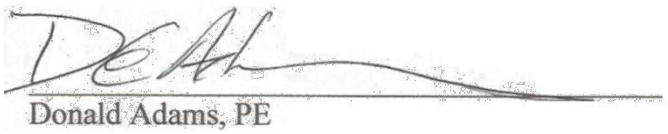
F. A Few Changed Specifications for the Drives Do Not Support Hospodor's Claim that the Drives Were "Unreliable" (Hospodor's Section IV.J)

107. In this section, Hospodor argues that changes in a few of Seagate's specifications for the drive—most at the very end or after the end of the class period (February 2016)—somehow show that there were problems with the drives. The conclusion does not follow from the evidence Hospodor cites. Changes in published specifications are are not evidence that an HDD is unstable or unreliable. Changes frequently occur for many high technology products over time. Spec-sheets

declaration or revise my opinions in light of additional information or documents that may be brought to my attention. I will consider any criticisms of my opinions or bases for my opinions brought to my attention or offered by experts retained by Plaintiffs, which may cause me to revise or supplement my opinions.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on this 5th day of January, 2018, at Pleasanton, California.



Donald Adams, PE